Two new species of *Mitrella* (Gastropoda: Neogastropoda: Columbellidae) from the lower Miocene Chipola Formation of northwestern Florida

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ABSTRACT

Two new species of *Mitrella* from the lower Miocene Chipola Formation of are described. *Mitrella hayesorum* new species and *Mitrella phyllisae* new species are found primarily in Chipola Formation exposures along Farley Creek in northwestern Florida, USA. Placement of the new species in the genus *Mitrella* is tentative.

Additional Keywords: Neogene, ultraviolet light, gastropod, *Astyris*

INTRODUCTION

Species assigned to the genus *Mitrella* are widely distributed in the warm and shallow waters of the Recent seas of the world (Gardner, 1947, 1948). The exact origin of *Mitrella* is not clear, but some of the earliest representative of the genus from the southeastern portion of North America appeared in the Eocene (MacNeil and Dockery III, 1984; Palmer, 1937). Maury (1910) described three *Mitrella* (as *Astyris*) from the Chipola Formation. These were originally deposited in the Cornell University collection at Ithaca, New York, and now deposited at PRI. With more specimens than Maury had at her disposal, Gardner (1947) described 13 species and two subspecies of *Mitrella* from the Chipola Formation.

Mitrella have been found in all exposed facies of the Chipola Formation on the Chipola River, Tenmile Creek and Farley Creek, in the Chipola River drainage in Calhoun County, Florida. They are also present in the Chipola Formation exposed in the lower bed at Alum Bluff in Liberty County, Florida. The two new species described herein have been collected only in the Chipola Formation exposures in the Chipola River drainage, primarily at Farley Creek. Vokes (1989) stated the Chipola facies along Farley Creek where the two new species are most prevalent is a bivalve-rich miliolid lime-sand with many calcareous algae and coral heads, and assumed it was a shallow back-reef environment.

Some specimens were photographed under ultraviolet light (UV) to facilitate visualization of color patterns. Institutional abbreviations are: UF: Florida Museum of Natural History (FLMNH for locality records), University of Florida, Gainesville; PRI: Paleontological Research Institution, Ithaca; ANSP: The Academy of Natural Sciences, Philadelphia; AMNH: American Museum of Natural History, New York.

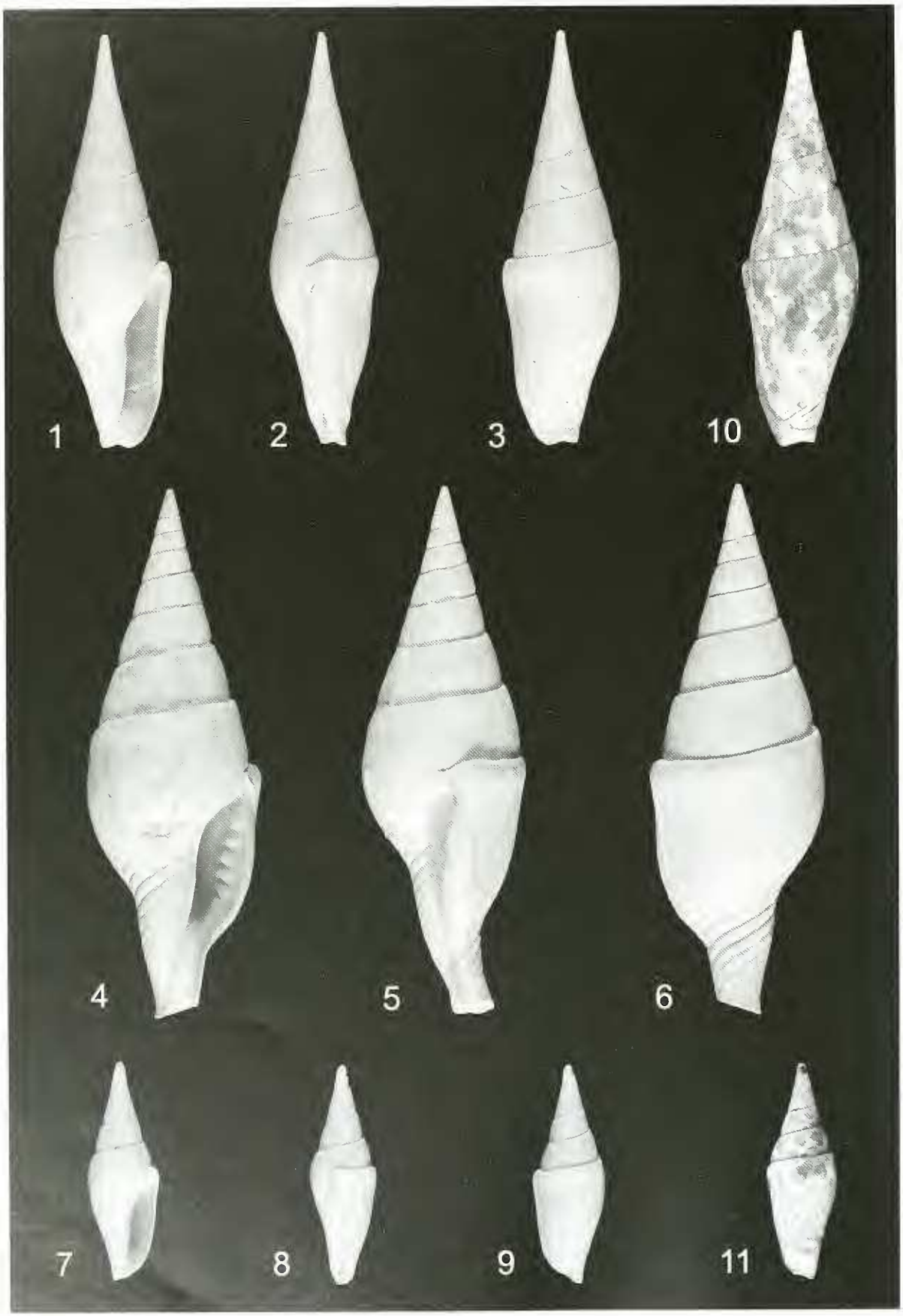
SYSTEMATICS

Superfamily Buccinoidea Rafinesque, 1815
Family Columbellidae Swainson, 1940
Genus *Mitrella* Risso, 1826

Diagnosis: Small to very small, smooth, fusiform shells. Sculpture, if present, of incised spiral lines. Spiral sculpture is generally restricted to the anterior end near the base: axial sculpture is, with few exceptions, entirely absent. The outer lip is dentate in adult specimens (Diagnosis according to Campbell [1993] and Keen [1971]).

?*Mitrella hayesorum* new species
(Figures 1–3, 10)

Description: Shell fusiform, narrow. Height of holotype 19.8mm. Protoconch mammillated, with about two smooth, rounded whorls, the second expanded, with no perceptible protoconch/teleoconch transition. Teleoconch with ten slightly convex, shiny whorls with microscopic irregular spiral grooves, axial sculpture lacking. Spire elevated with somewhat concave sides. Suture distinct. Aperture elongated, less than half the length of the entire shell. Outer lip sinuous, varicose externally, margin thin and sharp. Basal lip extending slightly beyond pillar. Posterior canal produced and thickened externally. Denticles present on inner surface of outer lip, ten to 12 in number, weak on anterior third, strongest on central third, frequently absent on posterior third. Parietal wall with two axial ridges, outer ridge weak with small raised beads reflecting underlying sculpture on pillar. Inner ridge prominent with median notch, adapical half of ridge strong, abapical half tapering and completely disappearing abapically. Base of pillar with about nine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oblique grooves with a rounded summit between grooves. Dark band about one third width of penultimate whorl appears below suture on last three whorls of holotype. Band has irregular narrow, oblique, light colored lines, some forming u- or v-figures.

Type Material: Holotype: UF 119655, height 19.8mm, width 5.6mm; Paratypes: ANSP-IP 81324, one specimen; AMNH-FI 43312, one specimen; PRI 8382, one specimen; Diegel-Duerr collection, one specimen. All from type locality.

Type Locality: FLMNH locality Farley Creek 07 (CA022), Farley Creek east of SR 275, Calhoun County, Florida (to protect privacy rights of landowners, specific locality information is available only to qualified researchers upon written request to the author or the Invertebrate Paleontology Division of the FLMNH), Chipola Formation.

Distribution: Chipola Formation along Tennile and Farley Creeks and the Chipola River, Calhoun County, Florida.

Etymology: Named to honor the forestry-oriented Hayes family who have graciously granted the author, and others, permission to collect on their property.

Remarks: The species currently placed in *Mitrella* comprise a complex group and may have been differently assigned to the genera *Alia*, *Astyris*, *Nitidella* by different authors (Keen, 1971). The taxonomic position of *M. hayesorum* is questionable and its current assignment to *Mitrella* is tentative. *Mitrella hayesorum* has unique characters, such as the bulbous second whorl of the protoconch, extended slightly concave spire and wide siphonal canal extending below the pillar, and cannot be confused with any other known *Mitrella*. Although no specimens of *Mitrella dalli* (Maury, 1910), the species in the Chipola Formation closest in form to *M. hayesorum*, were available for study, Maury's figure of *M. dalli* (1910: pl. 6, fig. 2) indicates a smaller shell (12 mm), a shorter, stouter spire, and a narrower anterior canal than *M. hayesorum*. The nearest European fossil congener of *Mitrella hayesorum* is *Mitrella (Macrurella) nassoides* (Grateloup, 1827) (Figures 4–6) from the early Pliocene of Italy, which is larger, wider at the midbody, and has a narrow anterior canal. The maximum height of all specimens of *Mitrella hayesorum* examined is 19.93 mm, minimum height is 18.17 mm. Exposure of *M. hayesorum* to ultraviolet light (Figure 10) reveals a fluorescent pattern of axial flammules in addition to the narrow band below the suture on the anterior whorls of the new species. Seven specimens of the most common *Mitrella* in the Chipola Formation, *Mitrella ischna* Gardner, 1947, a more robust species than *M. hayesorum*, were examined under UV light and revealed fine filamentous lines covering all teleoconch whorls. Three specimens of *Mitrella ascna* Gardner, 1947, a shorter species than *M. hayesorum*, exhibits, under UV light, narrow axial bars running from suture to suture, offset in alignment from previous whorls, with four per whorl on most teleoconch whorls.

?Mitrella phyllisae new species
(Figures 7–9, 11)

Description: Shell small, fusiform. Height 7 mm, width 2.2 mm. Protoconch with two smooth whorls, second whorl enlarged. Teleoconch with five smooth, convex whorls, without axial sculpture. Spire sides slightly concave. Suture impressed. Aperture less than half the length of entire shell. Outer lip with slight varix, margin thin and sharp, usually dentate within. Thin parietal wash present. About seven impressed oblique grooves cross base of pillar, separated by narrow bands with rounded summits. Faint round spots, eight on last whorl of holotype, appear on last three whorls. Spots about one-quarter the height of penultimate whorl in diameter rest just above median line of the whorls.

Type Material: Holotype, UF 119656, height 7.0 mm, width 2.2 mm; Paratypes, ANSP-IP 81325, one specimen; AMNH-FI 43313, one specimen; PRI 8383, one specimen; Diegel-Duerr collection, one specimen. All from type locality.

Type Locality: FLMNH locality Farley Creek 07 (CA022), Farley Creek east of SR 275, Calhoun County, Florida, (to protect privacy rights of landowners, specific locality information is available only to qualified researchers upon written request to the author or the Invertebrate Paleontology Division of the FLMNH), Chipola Formation.

Distribution: Chipola Formation along Tennile and Farley Creeks and the Chipola River, Calhoun County, Florida.

Etymology: Named for Phyllis Diegel, the author's companion and a knowledgeable conchologist and paleontologist.

Remarks: As with *Mitrella hayesorum*, the assignment of *M. phyllisae* to *Mitrella* is tentative. A cursory inspection would indicate *Mitrella phyllisae* to be a dwarf *M. hayesorum*. Closer examination reveals that *M. phyllisae*

Figures 1–11.—*Mitrella* species. **1–3.** Apertural, lateral, and abapertural views of the holotype of *Mitrella hayesorum* new species, UF 119655, height 19.8 mm, width 5.6 mm, Burdigalian Miocene. **4–6.** Apertural, lateral, and abapertural views of *Mitrella nassoides* (Grateloup, 1827) UF 119657, height 25.5 mm, width 8.6 mm, Zanclean Pliocene, from Liguria County, Ceriale, Italy, for comparison with *M. hayesorum*. **7–9.** Apertural, lateral, and abapertural views of the holotype of *Mitrella phyllisae* new species, UF 119656, height 7.0 mm, width 2.2mm, Burdigalian Miocene. **10, 11.** *Mitrella* exposed to UV light. **10.** Holotype of *Mitrella hayesorum* (same specimen as Figure 3) showing UV exposed pattern. **11.** Holotype of *Mitrella phyllisae* (same specimen as Figure 9) showing UV exposed pattern.

differs from the much larger *M. hayesorum* by the shorter spire, the slightly more impressed suture, and fewer oblique incised lines on the base of the shell. A series of dots about 1 mm in diameter are visible on *M. phyllisae* encircling all teleoconch whorls, one-third the length of the whorl below the suture, eight on the last whorl. Exposure to UV light reveals (Figure 11), in addition to the larger dots, a field of minute dots covering the entire teleoconch, somewhat reminiscent of the pattern on the Recent *Mitrella ocellata* (Gmelin, 1791) from the western Atlantic. Also, the anterior portion of the outer lip of *M. phyllisae* is less developed than that of *M. hayesorum,* which is wider and extends beyond the pillar. The height of all specimens of *M. phyllisae* examined varies less than 1.0 mm, from a maximum of 7.4 mm to a minimum of 6.8 mm.

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